

## MILLSITE RESERVOIR



### Introduction

Millsite Reservoir is in Castle Valley at the mouth of Ferron Canyon. It is a large impoundment of a mid-elevation desert at its interface with high, mountainous plateaus. It is one of several large reservoirs on the east slopes of the high plateaus of central Utah, so it does not receive a great deal of recreational use, although there is

a state park at the facility. High bluffs at the mouth of Ferron Canyon provide a spectacular backdrop to the reservoir.

#### Characteristics and Morphometry

Lake elevation (meters / feet)	1,893 / 6,211
Surface area (hectares / acres)	176 / 435
Watershed area (hectares / acres)	40,146 / 99,200
Volume (m <sup>3</sup> / acre-feet)	
capacity	22,194,000 / 18,000
conservation pool	2,466,000 / 2,000
Annual inflow (m <sup>3</sup> / acre-feet)	
Retention time (years)	
Drawdown (m <sup>3</sup> / acre-feet)	
Depth (meters / feet)	
maximum	31 / 102
mean	14 / 46
Length (meters / feet)	2,220 / 7,284
Width (meters / feet)	1,066 / 3,498
Shoreline (km / miles)	10.36 / 36.43

#### Location

County	Emery
Longitude / Latitude	111 12 01 / 39 06 00
USGS Map	Ferron 1979
DeLorme's Atlas and Gazetteer™	Page 38, D-2
Cataloging Unit	San Rafael (14060009)

The reservoir was created in 1974 by the construction of an earth-fill dam. The shoreline is owned by a number of different agencies, including the BLM, the State of Utah, the Ferron Canal and Reservoir Company, and possibly some private individuals. Public access is somewhat restricted. Water is consumed for irrigation, but also used for recreation and coldwater aquatic habitat. No changes are foreseen in water use.

### Recreation

#### LAKE REPORTS

Millsite Reservoir is within Millsite State Park, 2 miles

File Contains Data for  
PostScript Printers Only

## LAKE REPORTS

west of U-10 in Ferron City on Canyon Road (100 S).

The area is a four season recreational area. Fishing, boating, camping, swimming, and picnicking facilities are all popular. It is also a good area for watching eagles.

The park charges a \$3 fee for day use and \$9 for



camping (1991). Facilities include a boat launch, picnic pavilions, showers, flush toilets, drinking water, a sandy beach, and 20 campsites. An intriguing nine hole golf course is adjacent to the park.

### Watershed Description

The reservoir is situated where Ferron Canyon emerges from the Wasatch Plateau into Castle Valley. Bluffs rising 2,000' surround the reservoir three sides, and the fourth side opens to the desert badlands of Castle Valley.

Ferron Canyon has a large drainage area that consists of a large portion of the southeastern Wasatch Plateau. At the headwaters, small streams arise from glaciated valleys, winter snowpacks remain late in the season, and domestic livestock graze in the area. Duck Fork and Ferron Reservoirs are stabilized lakes near the headwaters of Ferron Creek. The creek cuts a deep gorge through the eastern plateau, then emerges as the canyon walls flare outward into the edge of the plateau. Downstream from the reservoir, flat, irrigated desert extends for a few miles beyond the cliffs, then canyons and reefs delineate the western edge of the San Rafael Swell.

The reservoir is located in the mouth of the canyon, where vegetation and weather is typical of the desert. Irrigation water from the reservoir allows the lands to the east to be irrigated for crops. Little if any of the canyon is irrigated.

The watershed high point, Heliotrope Mountain, is 3,392 m (11,130 ft) above sea level, thereby developing a complex slope of 7% to the reservoir. The average stream

gradient above the reservoir is 4.7 % (249 feet per mile).

The soil is of limestone origin and has good permeability and moderately slow erosion and runoff. Soil Associations are listed in Appendix III.

The vegetation communities are comprised of shadscale, pinion-juniper, saltbrush, sagebrush-grass, mahonia, mountain mahogany, grass-forbs, greasewood, pine, aspen, spruce-fir, oak and maple. The watershed receives 25 - 102 cm (10 - 40 inches) of precipitation annually with a frost-free season of 120 - 140 days each year at the reservoir.

The soil is of limestone origin and has good permeability and moderately slow erosion and runoff. Soil groupings are found in Appendix III.

The watershed is 90% owned by the Forest Service. While grazing is not permitted in the immediate vicinity of the reservoir, heavy grazing takes place throughout the watershed. The forest is used for hunting, recreation and livestock grazing.

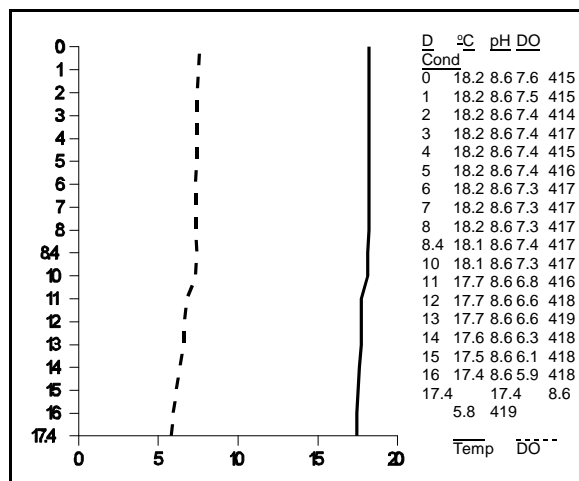
### Limnological Assessment

Limnological Data			
Data averaged from STORET sites: 593174, 593175			
Surface Data	1981*	1989	1991
Trophic Status	M	O	M
Chlorophyll TSI	-	36.64	41.59
Secchi Depth TSI	46.80	44.60	51.18
Phosphorous TSI	37.35	23.96	31.58
Average TSI	42.08	35.07	41.46
Chlorophyll <i>a</i> (ug/L)	-	1.9	3.1
Transparency (m)	2.5	2.9	1.9
Total Phosphorous (ug/L)	5	4	7
pH	8.1	8	8.4
Total Susp. Solids (mg/L)	<5	-	<3
Total Volatile Solids (mg/L)	-	-	1
Total Residual Solids (mg/L)	-	-	3
Temperature (°C / °f)	16/61	17/63	16/61
Conductivity (umhos.cm)	477	472	441
Water Column Data			
Ammonia (mg/L)	0.05	0.03	0.03
Nitrate/Nitrite (mg/L)	0.16	-	0.08
Hardness (mg/L)	234	-	231
Alkalinity (mg/L)	193	-	189
Silica (mg/L)	-	-	3
Total Phosphorous (ug/L)	5	6	8
Miscellaneous Data			
Limiting Nutrient	P	N	N
DO (Mg/l) at 75% depth	7.4	5.9	6.6
Stratification (m)	7-8	NO	NO
Depth at Deepest Site (m)	21	19.0	17.4
* One site only (593174)			

The water quality of Millsite Reservoir is very good. It is considered to be hard with a hardness concentration value of approximately 233 mg/L (CaCO<sub>3</sub>). There are no overall water column concentrations that have exceeded State water quality standards.

The potential for stratification in the reservoir does occur when there is sufficient depth and holding period. Although the profile shown of August 5, 1992 does not show it, stratification has been evident during other years.

Current data suggest that the reservoir is currently a nitrogen limited system. TSI values indicate the reservoir is oligotrophic or low mesotrophic in a state of low productivity. According to DWR no fish kills have been reported in recent years. The State Division of Wildlife typically stocks 20,000 advanced fingerling rainbow trout (*Oncorhynchus mykiss*). In addition, cutthroat trout (*Oncorhynchus clarki*) and bluehead sucker (*Pantosteus clarki*) are present in the reservoir.



The reservoir has not been treated to control rough fish competition, so native fish populations could be present. Stocking of hatchery fish and heavy fishing pressures, however, may have displaced all native fishes from the reservoir. It has a 2,000 acre-foot conservation pool, which guarantees adequate fish habitat throughout the year.

Phytoplankton in the euphotic zone include the following taxa (in order of dominance)

Species	Cell Volume (mm <sup>3</sup> /liter)	% Density By Volume
<i>Fragilaria crotonensis</i>	2.290	90.56
<i>Dinobryon divergens</i>	0.146	5.78
<i>Oocystis</i> sp.	0.050	1.98
Pennate diatoms	0.020	0.79

Centric diatoms	0.012	0.50
Unknown Chrysophyte	0.010	0.40

Total 2.528

Shannon-Weaver [H']	0.42
Species Evenness	0.23
Species Richness [d]	0.23

The phytoplankton community is dominated by diatoms and is indicative of good water quality in a state of low productivity.

### Pollution Assessment

Nonpoint pollution sources include grazing, summer home development, and recreation. Grazing is not permitted in the vicinity of the reservoir. There are no active mines or timber sales, but areas scarred in past projects may still impact water quality. All residential developments are several miles upstream from the reservoir.

There are no point pollution sources in the watershed.

### Beneficial Use Classification

The state beneficial use classification for the waters of Millsite Reservoir include: culinary water (1A), recreational bathing (swimming) (2A), boating and similar

Information	
<b>Management Agencies</b>	
Division of Wildlife Resources	538-4700
Division of Water Quality	538-6146
Bureau of Land Management	539-4001
San Rafael Resource Area	637-4584
Southeastern Association of Governments	637-5444
<b>Recreation</b>	
Millsite State Park	687-2491
Castle Dale Chamber of Commerce	381-2547
Castle Country Travel Region (Price)	637-3009
<b>Reservoir Administrators</b>	
Ferron Canal and Reservoir Company	384-2990

recreation (excluding swimming) (2B), cold water game fish and organisms in their food chain (3A) and agricultural uses (4).

## LAKE REPORTS